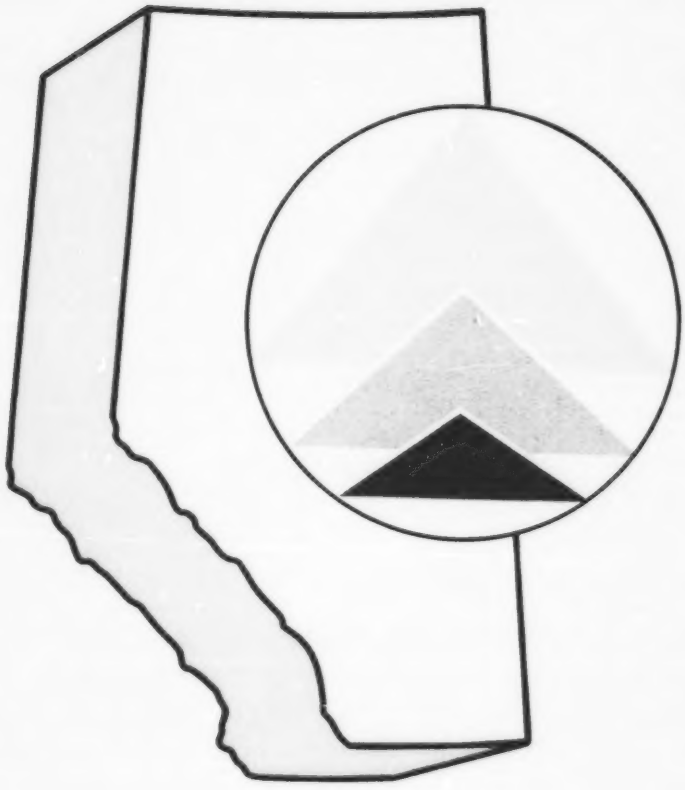
Alberta Conservation Strategy

Framework for Action



A Draft for Public Discussion

We Want Your Opinions

As the title says, this document is a draft framework for action. It provides a possible structure for making decisions to move us along the path to sustainable development. It also identifies many things that could be done in the context of this decision structure.

The Environment Council would like to know what **you** think are the five or six essential elements of a provincial strategy for environmental conservation in Alberta. In other words, what are the six key things that will make the biggest difference in protecting the environment of our province?

Please send your comments to the Environment Council at the address on the inside title page before **April 30, 1991**. The Council will compile the responses and make the compilation available for public distribution. Additional copies of this document and others in the Conservation Strategy series (listed in Appendix 3) are available upon request to the Council.

Alberta Conservation Strategy

Framework for Action

A Draft for Public Discussion

Prepared by
Public Advisory Committees
to the Environment Council of Alberta

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We have benefitted greatly from those who blazed the trail, among them the authors of the World Conservation Strategy; the World Commission on Environment and Development; authors of conservation strategies and supporting documents from other countries, in particular Australia and New Zealand; and Canada's own National Task Force on Environment and Economy. The works of these people are only some of the insightful documents published in recent years that gave us inspiration and hope.

We are especially grateful to the more than 300 resource people who participated in workshops and meetings, and who generously helped to prepare and review background materials. These individuals came from industry, business, colleges and universities, private consultancies, and departments of federal, provincial, and municipal governments. Their contributions broadened our perspective and improved the quality of our work.

Environment Council staff assisted us at every stage in the process and we thank them all. From compiling information, providing written material, reviewing drafts, arranging meetings, speaking to groups across the country, typing and editing manuscripts, to the final copying and distribution of materials, every one has played an important role.

Finally, our gratitude to Alistair Crerar, former Chief Executive Officer of the Council, cannot be overstated. Alistair believed in us from the beginning and gave us his full support at all times. His departure in the spring of 1988 to coordinate a Conservation Strategy for the Government of Pakistan was a great loss to us; at the same time, it strengthened our resolve to see the project through.

The Steering Committee members (listed in Appendix 1) have never wavered in their own commitment to the task. Their direction of the project on behalf of the Public Advisory Committees (PAC) kept us focused and our goal clearly in sight. In a project of this size and complexity, undertaken by an organization as diverse as PAC (see Appendix 2), it is impossible to have complete agreement on every detail. However, such a variety of perspectives in no way diminishes our commitment to the process of developing a Conservation Strategy for Alberta.

The formal role of PAC in the Alberta Conservation Strategy project ends with the publication of this draft Strategy package; it is with pride and pleasure we present the result of our efforts to Albertans for their consideration.

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Part I
Conservation Strategy Backgrounder

Chapter One

The Alberta Conservation Strategy Project

"If you don't know where you're going, you may end up somewhere else."

Introduction

Since the World Conservation Strategy was published ten years ago, efforts to make development sustainable have gained momentum around the world. There are now dozens of jurisdictions with conservation strategies in place or in preparation, a remarkable achievement considering that many countries were, like Canada, a little slow off the mark. Serious commitment to conservation strategies did not appear in this country until the mid-1980s, so great strides have been made in only four or five years.

Other developments mirror this growing interest in sustainability. The World Bank and the Canadian International Development Agency (CIDA) have made major changes in their lending and development policies to incorporate a longer term perspective and environmental accountability. Sustainable development branches are springing up in governments around the world. Many industries and businesses are moving in a "green" direction too, as public support grows for environmentally friendly products and processes. Books such as *The Green Capitalists* (Elkington 1987), the report of Canada's National Task Force on Environment and Economy (NTFEE 1987), and many other recently published documents make it clear that good environmental

decisions can be good economic decisions. Agencies and enterprises that are not "leading the parade" are likely to become "part of the pavement."

Sustainable Development: The Key Concept

The term "sustainable development" gained acceptance with the World Conservation Strategy (WCS), and has since been expanded and applied in hundreds of ways. The World Commission on Environment and Development (Brundtland Commission) made sustainable development its central theme, and built the entire Commission Report around this concept. Similarly, the draft Alberta Conservation Strategy (ACS) takes sustainable development as its most basic idea.

Defining Sustainable Development

The "environment" is where we live, and "development" is what we do to ensure that we have food to eat, clothes to wear, and someplace to live. Both of these are necessary; they are inseparable facts of our lives.

The effort to mediate the effect of development on the environment involves conservation, of the natural environment as well as other resources, such as economic capital. The World Conservation Strategy defines conservation as:

> *the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations* (IUCN 1980: Chapter 1).

The WCS uses the integration of conservation with development as the basis of sustainable development; in fact, the subtitle of the WCS is "Living Resource Conservation for Sustainable Development."

The World Commission on Environment and Development (WCED) emphasizes that sustainable development is not a fixed state. Rather, it is

> *a process of change [emphasis added] in which the exploitation of resources, the direction of investments, the orientation of technological developments, and institutional change are made consistent with future as well as present needs* (WCED 1987: 9).

Our definition of sustainable development is:

> *management of resources in such a way that we can fulfill our economic, social, cultural, and aesthetic needs while maintaining the essential ecological processes, biological diversity, and naturally occurring life support systems within Alberta.*

Sustainable development is similar to the phrase "best available technology" that is applied to pollution control equipment; it is the "best available idea" for addressing our environmental and economic future as part of the global community. It is not an instant cure for all the ills of the world; it is a pathway leading in the right direction.

The concept of sustainable development is sometimes criticized as being impractical. Some seem to think that we can never have development that is environmentally sustainable because all human activity disrupts the environment in some way. While it may be true that everything we do in the world changes the environment, it is possible for humanity to walk lightly on the earth. That is the goal toward which the Alberta Conservation Strategy project is directed.

Why Sustainable Development Is Needed

Efforts in this direction are urgently needed, because most people agree that the world's environment is getting worse faster. The Earth is our collective home, yet rational homeowners would never do to their own dwellings some of the things we have done as a species to our common home. We have a strong sense of pride and responsibility for our own individual homes. We expect to spend considerable time, energy, and money keeping our houses in good working order so the plumbing doesn't back up and the roof doesn't leak. We anticipate and prepare for changes every year when we check the furnace, clean the eavestroughs, and put up screens or storm windows. We also tend to the aesthetic aspects, both inside and out, by planting flowers and shrubs and decorating according to our own tastes. Our dwellings make an eloquent statement about who we are and how we live. With good care, they can last a long time, usually appreciating in value, and representing a piece of us that can be passed on to future generations.

Ever so slowly, as we have witnessed the degrading of the planet, we are realizing that stewardship must extend beyond our own backyard. Although the biosphere is far more complex and resilient than a house, we cannot continue to abuse and misuse the world's resources and expect to avoid the consequences of fouling our nest. Nevertheless, nature has tremendous powers of renewal and regeneration, and

a great deal of our work in maintaining a healthy planet will be done for us by natural processes as long as we do not ask for too much too quickly.

We ARE changing the way we view the world and our role in it, but this has taken time. The Industrial Revolution improved our standard of living, but it took us well over 100 years to recognize that environmental protection is a necessary companion to development if an improved quality of life is to be maintained. We have also begun to recognize that sustainable use of resources does not necessarily mean development. Non-development of land and its resources is an equally valid use. For example, setting aside a parcel of land with no access for any type of development, including recreation, means a decision has been made on the use of this land: it will be used to preserve habitat. The draft Alberta Conservation Strategy is not a plan to stop development, but strict preservation of some areas and resources is essential to any long-term strategy. Rather, it is directed toward achieving a healthier and wealthier province by managing our resources for the long run — that is, sustainably. This document reflects this perspective, as well as the point of view that development can take place with minimal damage to the environment.

One of the driving forces behind the interest in sustainable development is an awareness of the links between environment and health. Health personalizes environmental problems as nothing else can. For example, we control pollution so the air we breathe and the water we drink will not make us sick; we regulate the chemicals used in food production to ensure consumers do not eat or drink toxic substances. Health is correctly being viewed much more holistically, too, with more recognition of the importance of mental and emotional wellbeing to our overall quality of life. We care about other species with which we share the planet for reasons that have little to do with economics or commerce; just knowing, for example, that magnificent old growth forests, beautiful orchids, and lithesome wild cats exist meets some of our very deep-seated non-material needs.

Sustainable development is similar to good health — it's hard to know when you have it, but it's easy to tell when you don't. Medicine has devised batteries of tests to find particular problems; if they aren't there, then you are healthy by default. Of course this is oversimplified, but as we search for ways to measure sustainable development, we should question whether the default state is the model to use. Striving toward and measuring sustainable development should be an active effort, with indicators that assess our progress and provide us with constructive feedback. Initially, such indicators may have to be developed sector by sector. For example, targets might be set for a number of municipalities to establish recycling programs for

paper, glass, and metal, with specific budgets and dates for completion. At the same time, more effort would be needed to establish markets for recycled products.

Some might argue that our changing attitudes about the environment are too little, too late, and that humans have irreversibly damaged the planet. But, realistically, we are the only species that can do something about extracting the planet from the present situation. So the question becomes not "can we do anything?" but "then what do we do about it?"

The Alberta Conservation Strategy project, like those elsewhere in the world, was undertaken in a spirit of optimism and co-operation. There IS a better way and something CAN be done to halt and reverse the environmental deterioration around us. Conservation Strategies based on sustainable resource use offer guidance in our search for this better way.

The Value of a Strategic View

Sustainability requires that we build into our thinking a long-term, integrated view of the world, wherein economic development and environmental conservation are linked. Within limits, we can foresee the effects of our activity on the world. But this wonderfully unique human attribute is all too often wasted when there is a lack of strategic thinking to give direction.

Strategic thinking has become one of the most important factors in management, because a clear idea of where we are going is required before we can commit ourselves to a direction. (As the former baseball catcher Yogi Berra once said, "If you don't know where you're going, you're liable to end up someplace else.") Strategic thinking — that is, planning in accordance with an overall strategy — is what Conservation Strategies are intended to accomplish. The framework of a strategy can provide clear objectives and a sense of direction about our future .

We also need principles to guide us and to help us evaluate what we do; these are an essential part of a strategic framework. (The principles and strategic framework of the draft Alberta Conservation Strategy are described in detail in Chapter 5.)

A strategic framework is not a series of immutable rules. Rather, it contains elements to guide us in choosing the path to sustainable development. It provides "points of

reference and standards of evaluation with the ultimate purpose not of telling us how to act, but of developing our judgement" (Von Clausewitz 1976).

Conservation Strategies are designed to ensure that our economic activities are in harmony with our environment and resource base, leading us toward balanced and flexible implementation of environmentally sustainable development. Flexibility is a key element in any strategy designed to help us cope with an uncertain future, and the draft Alberta Conservation Strategy stresses this — it does not try to tell us how to run every aspect of our lives, our businesses, or our government. Strategic thinking is further characterized as being more proactive and anticipatory than many of our old methods of dealing with environmental problems, which too often resembled crisis management.

The Groundwork

The process of preparing a Strategy is as important as the product. While documents presenting the strategic framework and proposed actions are essential, the real product is a reorientation of values and priorities. This is what changes the way we conduct our lives, our business, and our government. The process is what makes the words come to life and "get done." At the heart of this process is public consultation and participation.

In early 1985 the Public Advisory Committees to the Environment Council of Alberta took the initiative to develop a Conservation Strategy for the province. Publication of the *Prospectus for an Alberta Conservation Strategy* in 1986 was the first step in getting consensus on the vision and objectives for the project. The background sectoral discussion papers that followed examined a great many issues (see Appendix 3). Many diverse ideas and suggestions about sustainable development came out of the early discussions. The result of this process is the strategic framework — a step toward a draft Alberta Conservation Strategy. Another important part of the project is the "What I Can Do for the Environment" compendium of actions individual Albertans can take to protect and improve our environment. These initiatives represent the Public Advisory Committees' vision for a healthy and sustainable future for Alberta .

The ACS project as a whole is intended to achieve the following:

1) To provide a practical guide to sustainable development in Alberta by:
   a) presenting a strategic framework for guiding policy;
   b) providing background material to support the application of the strategic framework (sector discussion papers);
   c) providing a list of practical actions that individuals, families, schools, communities, and businesses can take in their daily lives to improve the environment of Alberta ("What I Can Do for the Environment" checklist).

2) To refine and improve decision-making structures and processes, ensuring that all Albertans, present and future, have an attractive, environmentally healthy, and economically prosperous place to live and raise their families.

3) To obtain broad public consensus on an environmentally sound and economically sustainable future for Alberta, as reflected in an Alberta Conservation Strategy. This document should contain a clear and consistent decision structure to be followed, while allowing the flexibility necessary to deal with our rapidly changing world.

The next stage in the process will be up to the people of Alberta, in the broadest possible sense — legislators, bank tellers, dentists, corporate decision makers, bus drivers, and *you*. Each of us must evaluate how our daily activities contribute to or hinder sustainable development. The process we go through will be similar for all of us, but each individual, corporation, or family will achieve unique results. We all have a responsibility to do our part. The ultimate success or failure rests within each of us, and on the action we collectively choose to support.

Consensus

The term "consensus" has been used throughout this project to imply a general agreement of opinion about a topic or an issue. It does not necessarily mean unanimity on every item of every detail, but rather agreement in principle.

Table 1. The Making of the Alberta Conservation Strategy

Activity	Participants	Product	Timeframe
Assess support for Alberta Conservation Strategy, determine general principles and objectives	Public Advisory Committees to the Environment Council of Alberta	*Prospectus for an Alberta Conservation Strategy*	1986
Examine broad sectors for environment-economy links and examine intersectoral problems	Public Advisory Committees, some government, some general public	Draft sector discussion papers	1986 – 1989
Public reviews of draft sector papers	Public Advisory Committees, government, interested general public	Sector discussion papers	1986 – 1989
Develop draft strategy	Public Advisory Committees	*draft Alberta Conservation Strategy: Framework for Action, draft Alberta Conservation Strategy: Strategic Framework in Brief, What I Can Do for the Environment* checklists	1989 – 1990

Chapter Two

The Human Dimension of Conservation Strategies

"Let's treat Alberta as if we plan to stay."

The epigram above captures the essence of why we need a long-term view when we interact with our environment. We Albertans need to take the position that we are here for the long haul, and that irresponsible decisions made now could well come back to haunt us or our children.

Everyone understands the need to plan for the future — we put money in the bank for retirement; we make all kinds of decisions to ensure the wellbeing of our children. Everyone also understands that making decisions for the present at the expense of the future leads to ruin. "[A] culture of poverty is one in which the future is discounted — both implicitly and explicitly — at a very high rate" (Hardin 1985: 78).

But how are we to incorporate a long-term view into more of our decisions? This chapter examines some ways to develop a longer term perspective. The ideas in this chapter provide the social and cultural backdrop for the economic and scientific material discussed later in this document. They enable us, as thinking beings, to accept the need for a longer term view.

The Importance of Values

Sustaining our use of resources requires that we constantly judge present and possible future courses of action. Underpinning these judgements is a set of fundamental values. These beliefs are the glue that holds our society together, governing the way we behave and helping us adapt.

Values are learned and reinforced through institutions such as churches, schools, families, and governments. Fortunately, our value systems tend to be stable, but occasionally major shifts in societal thinking cause us to reassess our values. The goal of sustainable development is one such shift. If Albertans, like other citizens of the world, are to act on the message of sustainable development, the value of conservation must first be realized. There is a pressing need for individuals in all walks of life to become more aware of the benefits of conservation and the opportunities to develop without violating conservation principles. "Until people understand why they should safeguard ecosystems and species they will not do so" (IUCN 1980: Chapter 13). Part of the ACS process is to increase awareness of values — in particular, the role of communally held values in decision making.

> *A citizenry that is value aware can become a citizenry that understands its predicaments, adopts policies that are likely to extricate itself from those predicaments, and so evolve that the society can be sustained over the long run....A clarified value structure also provides a solid basis for policy analysis. Many policy disagreements are based on confusing presuppositions about values and beliefs that have not been clearly illuminated by reasoning to ground....We need to learn how to dissect policy proposals for the implicit values on which they are based, expose them to the light of day, and ask ourselves if this is really the set of values that we wish to serve. Indirectly this also leads us to ask what other values in our structure are not being served by the proposed policy* (Milbrath 1984: 115).

Although there may be some differences in emphasis, most of us have a standard set of values we think are important. Every human value system will continue to place an instinctive high value on one's own life — not just life in the physical sense, but quality of life. Once the physical needs are met, we need to recognize the importance of other factors (such as compassion, justice, and self-reliance) in enhancing this quality of life. Objective 4 of the draft ACS addresses quality of life.

Shared Responsibility and the Global Commons

Although the cliche "We're all in this together" is overused, nowhere is it more appropriate than in describing the future of "Spaceship Earth." All of us have to assume some responsibility if we hope to have a future for our species and our planet as we know it. Responsibility, it has been said, is a function of knowledge and power. We already know about many threats — ozone depletion, soil erosion, and groundwater contamination, to name a few. While our knowledge will always have some gaps, what we now need is the will to act on the knowledge we have before it is too late.

The Importance of Individual Action

Our time as individuals on this planet is limited, so we are stewards of the earth for only a short time. We have a responsibility to our descendants to pass the underlying natural processes of the earth to them in a healthy state. Albertans cannot, by themselves, ensure that the resources of the entire earth are well maintained and used responsibly, but we can look after our small portion of the world, even though we seldom have control over much beyond ourselves and our families.

Each of us has a personal responsibility to respect the natural processes of the earth in our own lives, as the phrase "Think globally, act locally" implies. That is why the draft ACS emphasizes personal responsibility. We have, in other words, a duty to make our activities sustainable for the long term by minimizing our harm to the life processes of the Earth.

The impact of individual action is often underestimated. For example, we may not realize it, but our food purchases influence decisions made on farms in Canada as well as on ranches in Australia, coffee plantations in Guatemala, or fishing boats on the Pacific Ocean. As consumers of natural and processed resources, we have the potential to make a difference in the quality of the environment.

But people need to know what changes they can make in their own lives to help ensure a more prosperous and environmentally secure future, not just for themselves and their families, but for the global community too. Paradoxically, it often seems easier to assist the homeless and starving in Ethiopia or Somalia by making a contribution to some international aid agency than it is to improve the lot of our fellow needy Canadians, or to help prevent the devastation of tropical rain forests than to do

something about soil degradation in Alberta's farmland. Of course things are not really so simple, but many of us become intimidated and overwhelmed when we start to think about the social, environmental, and economic problems facing humanity today. Taking one step at a time and trying to put our daily decisions into a broader long-term context will help to move society along the path to sustainability.

Responsibility for environmentally sound decisions and actions must begin at the level of the individual, then build to the neighborhood, community, regional, provincial, national, and ultimately the global level. At each level, there is a huge increase in potential impact of the many small decisions made by individuals. Governments at all levels are particularly obliged to be responsible, having been given the trust of people to act in a manner that reflects the public's values. Business, industry, and academia all have responsibilities to live up to as well, and again the fundamental pieces in ensuring that this happens are the voice and action of the individual, whether as a consumer, shareholder, voter, or taxpayer.

Living in the Global Commons

A global view is important because we, like everyone else, cannot live isolated from the rest of the world. The relationships we establish with others on the planet affect our economic status, influence our culture, and shape our politics. Environmental links between jurisdictions tend to be less apparent than many other links because of overriding economic, social, and political factors; they often go unnoticed until or unless something goes wrong. While it is not the only cause of political instability, for instance, environmental degradation and irresponsible resource use often exacerbate social and economic problems, leading to or inflaming existing conflict. Africa, where drought is commonplace and fuel is in short supply, is a good example. Unrest in the Persian Gulf is also related to resource use and management, and such conflicts affect resource-dependent Alberta by influencing international prices. Movements such as the anti-fur lobby can also have an impact in our province, in this case affecting the livelihood of Alberta trappers.

Air, water, and many species of wildlife do not respect political boundaries, and transboundary differences over pollution and resource management have become more common around the world as demand for resources grows. Furthermore, events such as the nuclear accident at Chernobyl and thinning of the ozone layer show our common vulnerability to environmental degradation.

How should we in Alberta assume responsibility for protecting resources that are of value to the world as well as to ourselves? We can protect directly resources under our provincial jurisdiction (such as forests, endangered species, and rivers), with policies and legislation that prohibit pollution, influence land use, and so on. Transboundary pollution is more problematic. In such cases, the benefits and the costs usually are not borne by the same jurisdiction, making solutions difficult to reach. Acid rain in North America and in Europe is probably the best known modern example of such an issue.

Alberta too has transboundary responsibilities with respect to air and water use. In northeastern Alberta where most of the heavy oil and tar sands development is occurring, there is concern about the effect of sulphur emissions on sensitive areas downwind in northern Saskatchewan. Alberta's mountain and foothill regions are the source of major transboundary rivers, giving our province a responsibility to ensure that both the quality and quantity of water passed to downstream users is acceptable. All Alberta rivers that flow into other jurisdictions are now subject to transboundary agreements and negotiations regarding both water quality and quantity. Probably the best known and most comprehensive is the Master Agreement on Apportionment, signed in 1969 by Canada and the three prairie provinces.

International agreements such as CITES (Convention on International Trade in Endangered Species) and the Migratory Birds Convention protect endangered species and migratory animals, while other conventions limit pollution in the global commons of the seas and the atmosphere. These have met with some success, but generally require many signatories, powerful peer pressure, and conscientious enforcement to be effective.

Threatened and endangered species, especially those that migrate, are difficult to protect, since their survival depends on maintenance of habitat. For example, the Philadelphia vireo spends the summer in Alberta's aspen parkland where, despite some habitat loss, it is still secure. The species overwinters in Central America, however, where much of its habitat is lost or threatened. Other migratory or wide-ranging species that spend time in Alberta, and for which we have some responsibility, include grizzly bears, wolves, caribou, whooping cranes, peregrine falcons, eagles, and various songbirds.

Alberta's own gene pool of plants, animals, and microbes has adapted to conditions that have evolved over many thousands (and in some cases millions) of years. Although our biota is not nearly as diverse as that of many other places, the same principle applies — that we should not knowingly cause the extinction of any species.

Alberta also has an international responsibility to protect those aspects of our natural and cultural history that characterize the province, and in many cases are unique.

Few environmental issues are truly global in nature — in the sense that the entire planet is at risk — but both climate change and damage to the ozone layer fall into this category. Alberta's economy is largely dependent on oil, gas and coal; the use of these resources has been implicated in the atmospheric build-up of "greenhouse" gases, which are contributing to climate change. These fossil fuels are nonrenewable resources in any event, and Albertans should be responsible users by conserving energy (in the interests of reducing total atmospheric emissions), extending conventional energy supplies, and ensuring an efficient and productive economic base. With respect to protection of the ozone layer, the 1987 Montreal Protocol, to which Canada is a signatory, calls for a 20 percent reduction in the release of chlorofluorocarbons (CFCs) by 1994, and a 50 percent reduction by 1999 in developed countries. While developing countries get a ten-year reprieve, after that, they must match the reduction rate of developed countries over the following decade. Some provinces as well as the Canadian government are moving more rapidly than required by the Protocol to phase out the most dangerous CFCs. Ontario legislation proposes to ban CFCs entirely over the next decade, and the federal government intends to curb CFC use by more than 85 percent over the same period (*Financial Post*, February 7 and 21, 1989).

Many developing countries are now looking to the developed countries, particularly those in the west, to guide their own aspirations. The ethical dilemma posed by this situation will not be easy to resolve. Developed nations, with just 25 percent of the world's population, now account for 80 percent of global resource use. This pattern of resource consumption is not sustainable, and clearly something will have to give if more of the world is to have an acceptable standard of living. Sustainable development is the only hope for our long-term survival; Canada along with other developed countries will not convince any poorer nation to protect its environment without having our own house in order. And the place to start in this country is with provincial and territorial strategies for sustainable development.

Environmental Education and the Alberta Conservation Strategy

The World Conservation Strategy recognized that environmental literacy is important to sustainable development. It states:

> *Ultimately the behavior of entire societies towards the biosphere must be transformed if the achievement of conservation objectives is to be assured. A new ethic, embracing plants and animals as well as people, is required for human societies to live in harmony with the natural world on which they depend for survival and wellbeing. The long term task of environmental education is to foster or reinforce attitudes and behavior compatible with this new ethic* (IUCN 1980: Chapter 13).

The traditional classroom can be an effective way to reach a large number of young people at a time in their lives when their values are being formed. If we hope to effect long-term change, education infused with a sustainable development ethic is the best way to go. This means incorporating an environmental and conservation theme into the entire program, not confining it to science or biology or social studies. Understanding processes, and learning how to solve problems and synthesize information, are valuable skills that remain with a person for a lifetime, and should be emphasized in the curriculum. Environmental factors influence our culture, our economy, and our social structure, and until these connections are made, environmental education will unfortunately continue to be seen as a frill, rather than a central feature in a balanced education.

But this is just one way in which we acquire knowledge. Education in its widest and most practical sense continues as long as we are alive, and learning from our experiences is often more effective than formal knowledge gained from the classroom. Museums, interpretive centres, public lectures, television programs, and a host of popular literature are all avenues for continuing education.

Access to pertinent and accurate information is an important component of adult education. Continual opportunities to learn informally are important in developing a conservation ethic among adults, who in turn influence the attitudes of their children. Often new information causes us to shift our attitudes, sometimes imperceptibly at first, about the world around us. But as more information becomes available and we are convinced it is reliable, then we may choose to modify our behavior to be consistent with our new attitude. As more information came out on the use and effects of agricultural chemicals, for example, interest in "organic" or chemical-free food crops increased. A larger market was created, which in turn meant that growers

who produced their crops without using chemicals had greater assurance of selling their produce.

The critical mass of committed people required to permanently change society's attitudes toward the environment is difficult to judge. For example, many people perceive, partly because they have been told it by influential but poorly informed persons, that environmental protection can only be achieved with high economic costs, including the loss of jobs. This is not the case, although it sounds superficially plausible. A number of developed countries have demonstrated that environmental protection can create jobs and other economic benefits, and well over 90 percent of Canadians believe environmental protection and conservation is an important issue, a point which is now reflected in the political agenda. The Alberta Conservation Strategy project is designed to help us reach that critical mass as expediently as possible.

Public participation is another way in which people learn about environmental issues. Albertans as a whole have come to expect opportunities to be involved in the environmental decision-making process, and the quality of public input obtained over the years in our province has been consistently high. When faced with an issue they believe is important, responsible citizens will inform themselves about it. It is, therefore, the responsibility of government, industry, business, and other institutions, such as academia, to provide reliable information about matters for which they are accountable. The draft Alberta Conservation Strategy has a major role to play in environmental education. If the project helps to bring into being a widespread sustainable development ethic, it will have succeeded in large measure.

Healthy Communities

Like "environment", the word "health" suggests different things to different people. Sustainable development, however, provides the perfect opportunity to blend the laudable goals of a clean environment and health for all — goals that are contributing to a remarkable shift in attitudes as we near the end of the 20th century.

We have made much progress in improving physical living conditions, which has meant longer, healthier lives for many people. This success has raised our expectations, and while we strive for continued improvement, we must be careful that

we do not become too impatient and mistake our failure to progress as quickly as we would like for failure to progress at all.

Now that the developed world has successfully countered most health threats related to sanitation, safety, and hygiene, the focus has shifted to more complex health matters that may be related to the environment in different ways — allergies, cancer and heart disease, for example. Mental and emotional health are also recognized as important to our general wellbeing, and the environment can play a major role here too. But the cause and effect relationship is not nearly as obvious with these problems as it was for many of the gross threats to health; several physical or environmental factors may be interacting in unpredictable ways, and socioeconomic influences are also known to play a role in many health issues. Often these emerging issues impinge on overall quality of life rather than threatening life directly, and that too can make it more difficult to convince decision-makers to pay attention to them before they become more serious.

The healthy community concept stresses that human health is more than freedom from disease; it is a state of positive physical, psychological, and social wellbeing that is only attained in a favorable physical and social environment (Richardson and Hancock 1988). This assertion challenges the traditional narrow view of health with its focus on treating disease, and is compatible with the idea that humans are a resource of great value. Basic needs will continue to be met, but it is important that they are met in ways that allow communities and individuals to thrive in harmony with the environment. It is critical to meet recreational, aesthetic, and other non-material needs today in order to have healthy, sustainable communities tomorrow.

Creating conditions necessary for self-reliant and sustainable communities is no easy task. To sustain themselves, communities must have some economic base, and the connections between environmental health and economic health are becoming more important and more apparent. In the past, much of the wealth-generating development relied on access to raw materials, transportation, and markets, giving an advantage to areas that could provide these things. Current growth in the service and information sectors will diminish the value of such locational advantages and make it much easier for communities to compete on the basis of their amenities and their quality of life and its associated costs. Many information and service industries are footloose and are prepared to be quite selective about where they locate. Studies have shown that good recreational and cultural facilities and a good education system, for example, are key factors in attracting and retaining such industries. It

should also be recognized that some communities have chosen quality of life as the ultimate consideration when planning future growth and development.

To establish healthy communities, decision makers in all sectors and at all levels must anticipate the impact of policy decisions on health, in its broadest sense. Necessary actions then become apparent; in most cases, all that is required is a slight shift in priorities, with costs that are frequently negligible. Small things can be done locally on many fronts. Initiatives as diverse as planting trees, toxic waste round-ups, no smoking bylaws, effective counselling programs, a supportive family structure, and many others have all been shown to improve community health. The importance of healthy communities is recognized in the draft Alberta Conservation Strategy in Objective Five, which deals with the urban environment.

Human Beings as Our Most Important Resource

Human beings are the world's most critical resource because we hold tremendous powers of creativity and destruction. We are the only species that can make decisions about the future and the only species that can do something about the current state of the world. The human spirit is inherently strong and optimistic, and the challenge is to find ways to tap this strength and optimism in ways that benefit both the individual and the society to which he or she belongs.

While we have emphasized the importance of maintaining habitat and the biosphere as a whole, the integrity of human inhabitants and their cultures must also be maintained. Development needs to be sustainable environmentally and economically, and it should also sustain our social, cultural, and political life. Yet, when whole countries struggle daily to meet the most basic needs of food, shelter, and clothing, it is impossible for them to think about education or environmental quality 20 years from now. The sheer size of this immediate task has dwarfed efforts to improve their quality of life.

Education — more precisely, literacy — is fundamental for a population that desires a better quality of life and hopes to be self reliant. Any society without a high level of literacy will continue to underachieve. Within the last three decades, there has been a tremendous increase in the amount of information available to the general public, and in our understanding of how the world works. This rate of change is much more

likely to speed up rather than slow down; in fact, predictions are that there will be more change in the remaining few years of the 20th century than in all preceding years. The only way we can hope to adjust is by adequately preparing ourselves to deal positively with change rather than fear it; to be confident that we can use change to our advantage. This can only happen through a multi-faceted education that teaches us to think, not just to absorb facts, and to be able to question knowledgeably what is going on around us as well as statements and decisions that affect us.

Technology has changed our day-to-day lives, especially in the workplace. No matter what type of work we do, technology has helped to make all of us more productive in the last few years. Adjusting to these changes has been wrenching for some, exhilarating for others.

Our ability to cope is related in no small measure to our outlook on life, our self value, and the attitudes we have toward learning. These attitudes are formed early in life and merely reinforced as we grow older. If Alberta expects to prosper in the coming decades, our young people must be given an education that will prepare them for the future, while at the same time instilling in them a positive attitude toward learning in its broadest sense. While much emphasis has been placed on science and technology, we need to maintain a balance with studies of the humanities too. From such a balance comes the wisdom we desperately need to use information appropriately in a world that needs all the help it can get.

Although education and literacy may be the touchstones for developing our human resources, other elements are also needed; among these are a sense of equity and fairness, and opportunities for people to participate meaningfully in processes that influence their lives. Access to education, health care, and other essentials that enable humans to develop their full potential should be fair and equitable. When people perceive they are being left out, the sense of teamwork needed to work toward sustainable development is lost. Likewise, when people are denied sincere opportunities to be involved in the decision-making process, they lose any sense of commitment to the process and to the outcome. No one has all the answers, and experience has shown that when public input is obtained, the solutions and the long-term commitment to them are very much better.

Getting our own house in order means a close, hard look at our human resources as well as our other natural resources. As a species, we can direct our creativity and intelligence to improve the quality of life for millions of people or we can squander

what may be the last chance to ensure the survival of our planet as we know it. Qaboos bin Said, the Sultan of Oman put it thus:

> *All of us, together, vigilant and dedicated, with God's continuing guidance and the collective determination of all nations, can ensure that the races and religions of the world shall live at peace with one another, in harmony with their common environment. If we fail in this endeavour, future generations may be forced to exist like those hunter-gatherers of long ago. But this time round there may be nothing left for them to hunt or gather* (IUCN Bulletin 1988: 3).

Chapter Three

Pillars of Sustainable Development

"There's no such thing as a free lunch."

Several fundamental concepts must be appreciated and understood if development is to be sustainable. These concepts are so important that less than a full understanding of their significance will undermine any efforts to make development sustainable. Furthermore, understanding only one or two is not enough; like the foundation of a large building, *all* the pillars of sustainable development influence the soundness of the overall plan. These concepts are the base on which everything else rests, and they are presented under the following titles for you to consider carefully: Carrying Capacity; Shortages, Longages, and Price Distortion; Growth and Development; Non-renewable Resources and Sustainable Development; Accounting for Time; and Regulation.

Fundamental Concepts

Carrying Capacity

Sustainable development implies a limit to the natural ability of the earth to provide resources for human use. While there may be no limits to the creative ways we use the earth's resources, there are both physical and economic limits to resources that are actually available at a given time. Economic activity is nothing more than the application of human knowledge to the physical world. At its most basic, the world

economy is based entirely on human use of the resources available to us. Conservation Strategies emphasize the effective and efficient use of these resources from a long-term perspective.

Thus sustainable development is nothing new. It is simply a more informed expression of the ancient truth that activities are constrained by the physical limits of the earth. In biology, this idea is expressed as "carrying capacity," a concept often applied to other animals but seldom to humans. The essential resource in shortest supply at a particular time determines the carrying capacity of an environment. For other species, this least available resource might be water, food, hiding places, nesting sites, and so on. For humans, the list might include shelter, energy, recreational opportunities, and medical assistance. In economic terms, this same idea is called scarcity. Economic theory is based on this concept; one wonders why the powerful idea of carrying capacity has rarely been carefully applied to the human condition.

> *Human carrying capacity has been defined as being "the number of persons sharing a given territory who can, for the foreseeable future, sustain a given physical standard of living, utilizing energy and other resources (including land, air, water and minerals) as well as enterprise, skills, and organizations"* (Hanks 1987: 9).

An important expansion of the above definition is necessary for our purposes, however. In Alberta, it is not only the material standard of living that we are concerned with. This draft Strategy also takes our quality of life into consideration when we discuss the carrying capacity of the province. Much more than mere survival is the goal of the draft Alberta Conservation Strategy.

Human carrying capacity is based on existing resources, and our economic, cultural, and technical ability to use them. The extent to which we master and apply our technology (defined broadly) determines how far we can stretch the resources available to us. Sustainable development demands that we stretch those resources we choose to use to the maximum, while consciously reserving a supply for the future. There are as many ways to stretch our resources as there are human ideas but, unfortunately, experience tells us that it is easy to use resources in an unsustainable manner.

The concept of carrying capacity is overdue for discussion in the public arena now that the world population has exceeded five billion and is increasing by 75 million per year (Brown et al. 1987). The resources of the earth cannot support this number of people at the standard of living Albertans take for granted unless there is a technological "stretching" of our resources that defies the imagination. Development

that is sustainable can provide some breathing space while new and more appropriate technology catches up with our need.

Shortages, Longages, and Price Distortion

Many civilizations have fallen due to a mismatch of resource supply and demand, and this is still a problem today. But how one defines a problem determines how one sets about solving it. Excessive demand for limited resources is usually described as a shortage of supply — that is, the problem is expressed as a need for more of the resource to satisfy a demand that is assumed to be given. Until Garrett Hardin (1985) coined the word "longage," there was no English word similar to "shortage" to describe a surfeit of demand.

Supply, demand, and price cannot logically be separated. Demand is determined by some combination of price and supply. As the price rises, more supply can be economically produced. But as the price rises, demand will be reduced, because some can no longer afford the item or there are cheaper substitutes. Thus, logically, supply, demand, and price interact to discourage overuse of certain resources. That is, as the supply of a resource becomes scarce or hard to find, extract, process, or transport, or the environmental costs to society rise, the price logically should rise, and less will be used as demand drops off. This efficient system for allocating resources can be disrupted by a longage of demand.

Longages of demand are often caused by uneconomic, taxpayer-subsidized support for a particular good or service. Shortages of supply are sometimes caused when such subsidies are reduced or removed. Then those conditioned to the subsidized price complain loudly about shortages when, in fact, a longage of demand had arisen due to distorted pricing. Reduction of demand for energy through such mechanisms as gasoline taxes; energy efficiency improvements; substitution of ceramics, aluminum, and plastics in motor vehicle components; or using electronic communications instead of physically transporting people and goods are all making our economy more sustainable. Sustainable development is primarily demand-driven, but it emphasizes quality, durability, efficiency, and product cycling rather than deprivation.

Sustainable development will not solve all our resource scarcity and pollution problems, but it can at least guide us in directions that will help alleviate the "pollution of poverty" — the pollution and resource degradation that are inevitable where we do

not have in place the knowledge and expensive infrastructure needed to mitigate human impact on the earth.

Growth and Development

To come to an understanding of sustainable development, a distinction must be made between growth and development. Growth means more of something — greater numbers or larger in size, while development involves differentiation and results in an increase in complexity. Development normally makes possible specialization and efficiency.

In the biological world, growth without differentiation can not take place for long, if for no other reason than the form of relationships between parts is not linear. The following simple analogy illustrates that continual biological growth is a virtual impossibility. Consider an animal shaped like a cube with dimensions one by one by one. The volume is one cubic unit. Were the animal to grow to two by two by two, its volume would be eight cubic units. Because the relationship between volume and length is cubic, the animal now has eight times the volume and presumably the mass it had prior to growth. A mere doubling of linear dimensions has put much more stress on the skeletal structure, circulatory system, thermo-regulatory system, and so on, of the animal. Furthermore, even assuming that such animals could survive the mechanical stresses of growth, as the population increases, their energy requirements would quickly outstrip the ability of the environment to provide food.

The recurring patterns of developmental biology contain some wisdom for managing our environment and economy. At least we must understand that human use of resources and economic growth is not limitless, and that economic growth must be accompanied by development. New structures, policies, and mechanisms to generate environmentally sound development rather than simply support more growth must be implemented. Using more and more resources is physically unsupportable. Instead, we must strive to use resources more effectively, efficiently, and creatively.

Economic development means adding value to existing products or creating new products, using processes that are sustainable environmentally and economically, or applying new technology for more efficient production, use, and reuse. It means better refinement and processing techniques, higher quality, improved durability, and environmentally sound economic activities. The 4Rs of waste management — Reduction, Reuse, Recycling, and Recovery of resources — represent sustainable

development insofar as the long-term economic and environmental impacts are reduced. Shipping plywood rather than unfinished timber, steaks rather than live beef, antifreeze and plastic automobile components rather than natural gas, and fertilizer rather than sulphur are all examples of development. When these things are produced in a manner that does not impede future resource use, then the development is sustainable.

Ultimately, our very survival, and in the short term, our comfort — our lives and livelihoods — depend upon our ability to recognize such innovations. Successful integration of the environment and economy — sustainable development — depends upon our ability to synthesize and apply knowledge about biological and economic systems. Identifying sustainable development is a challenge, one of the highest order. Fortunately, most of the information probably is available in raw form.

Non-renewable Resources and Sustainable Development

Renewable resources easily lend themselves to sustainable use, but how can this concept be applied to constantly depleting resources such as oil and gas, or minerals? The answer is simple: non-renewable resource extraction should always be viewed as a temporary investment strategy designed to assemble the capital, knowledge, and skills needed to support a sustainable society. Non-renewable resource development should be used to provide options for future development.

Roy Aitken, Executive Vice-president of Inco Ltd. and co-chair of the National Task Force on Environment and Economy, further notes:

> *Don't exploit the [non-renewable] resource at a rate which exceeds your ability to develop another or develop a substitute product. In both cases, don't compromise the sustainability of the host environment, the air, water, and terrestrial resources* (Aitken 1988: 4).

Accounting for Time

One of the reasons sustainable development is not practiced is that it requires a much longer time scale than most of us are used to dealing with. A parent with hungry children is likely to plan for the short term exclusively. A wealthy corporation may plan many years ahead, provided shareholders and the Board of Directors are satisfied with quarterly or annual performance. One might think a nation should plan as if its future were infinite, since when nations cease to exist, there are usually

catastrophic wars or monstrous internal strife and privation. Yet elections every four or five years make it hard for our political decision makers to plan for future decades. Without the continuous support and guidance of the public, elected representatives facing conflicting choices are often forced to opt for short-term measures rather than planning for the longer term.

The pressures for short-term action are intense because some special interest group always stands to gain from any exploitation of resources. However, to protect longer term societal interests, resource allocation and exploitation must be balanced. This is difficult at best. Since few are fighting for the economic interests of the next generation, or even for our own interests later in life, the immediate benefits of present exploitation appear irresistible.

Let us take an example. Assume many corporations would like to have access to some mineral resources that are not renewable in less than geological time spans. Economists argue that extracting this mineral resource will lead to a certain number of new jobs (mostly for the short construction phase). Indirect benefits (in services, supply, and transportation) and other estimates will be factored into the equations. The calculations will be based on statistical functions and assumptions about future prices, costs, tax regimes, royalty fees, and other numerical data. These figures may or may not be correct, depending on the validity of the assumptions. But one important assumption about the future will not be found in the calculations. It is never assumed that we and our children might need this economic development more in 2010 than we need it today. Under our present system of accounting, it is virtually impossible for us even to consider the possibility, because our estimations of value "discount the future" (see box).

But a balance between present and future can be reached. Minerals can be mined and used at a rate that provides for anticipated future needs. Forests can be cut at a rate that allows enough reinvestment to maintain economically viable forest harvesting for the indefinite future. This balanced approach depends on efficient and effective managers who take as their point of reference and standard of evaluation a continuous supply at a given rate of use for the indefinite future. Such a management regime is equivalent to living off the interest of our resources while conserving the principal for our future and that of our children.

Many of Alberta's resources have been managed according to this philosophy for some time. Alberta's forests, fisheries, wildlife, and, until recently, petroleum resources have been carefully allocated (supply limited) in anticipation of future shortages caused by overexploitation. However, we must be careful to prevent

"Discounting the Future"

Why do we assume resources will be less valuable in providing jobs and economic activity to our children than to us?

Economically, rapid resource exploitation in the short term tends to be more profitable than maintaining a level of production or exploitation which may be sustainable but yield lower returns. Interest rates and the structure of our economic system in general have encouraged short-term decision making, often leading to over-exploitation and irreversible depletion of resources.

At fault is our reliance on an economic concept called the "present value" that is based on another concept called the "discount rate." These concepts assume that all money invested now would be worth less if we waited and invested it at a later date. The idea makes a certain amount of sense because there are usually investment opportunities that will make present dollars worth more in the future. Since one dollar earned today can be invested and earn interest, one dollar earned at some point in the future is not as valuable as one earned today. The effect is to encourage rapid exploitation of resources. The "present value" of future dollars can be calculated according to the rate at which present dollars can be safely invested and the period of time between receiving dollars today and receiving them in the future. This procedure "discounts the future" at whatever interest rate is chosen. (Inflation adds directly to discounting the future and thus to increased resource exploitation).

The significance of interest rates can be demonstrated by the following example: Suppose we want to invest in a resource development that will take 20 years to yield an income. For simplicity, we assume all expenses occur in Year 1 and all income occurs in Year 20. In order to derive an income of $1 million from this endeavor in 20 years, at an interest rate of 10 percent, we can afford to invest no more than $148,644 now. If we must invest more, we are better off leaving our money in the bank to accumulate interest. The difficulty arises, however, if $148,644 is not enough to develop the resource sustainably.

The table below gives the present value, in dollars, of one million dollars at some later time, assuming various interest rates and various periods of time.

Interest Rate Per Year	Time in Years				
	5	10	20	50	100
3%	$862,609	$744,094	$553,676	$228,107	$52,033
10%	620,921	385,543	148,644	8,519	73
20%	401,878	161,506	26,084	110	one penny

Source: Hardin 1985

overexploitation of resources, without allowing bureaucratic control to dominate economic processes.

Regulation

The Effect of Regulation: React and Cure

Government has often reacted to public pressure for better environmental controls and more public involvement by tightening environmental standards, increasing penalties, and increasing enforcement. This "react and cure" approach has improved our environment in some areas, but its major contribution has been simply to slow degradation of our land, air, and water. And the react and cure approach to environmental problems proceeds slowly, sector by sector. Because standards are normally tightened only after the damage has been done, there is a slow downward spiral in environmental quality.

Practicality dictates that we minimize changing rules in the middle of the game. In the case of pollution standards, government is often called upon to improve old regulatory standards as new scientific knowledge proves certain chemicals or processes more dangerous than originally believed, or as more efficient technology emerges. When this occurs, industrial infrastructure that may not be very old is frequently made economically obsolete due to the projected high cost of retrofitting equipment to meet the new standards.

Cries of foul play are then raised by the industry, with the frequent result that taxpayers and consumers pay for all or part of the retrofit. Alternatively, the offending plant (under the new standards) is allowed to continue without meeting current standards. In this case, the indirect costs are incurred by the public in the form of environmental deterioration, detrimental health effects, and increasingly uncompetitive industries with outmoded technology. Rarely is the industry put to the test to find out if the plant would indeed stop production and go out of business, and whether another more innovative and creative corporation might move into the void, meet the standards, and provide a sustainable industrial base.

Standard setting is a seemingly endless bureaucratic game of catch-up. By the time scientists have determined that some level of a substance is more dangerous than originally proved, regulations based on the earlier estimates have led to uncounted decisions by industry to meet those standards. The twin faults of failing to provide financial reasons to improve on legally mandated standards, plus the political

acceptance of taxpayer subsidies when tougher standards are applied to established industry, lead to rational business decisions not to exceed what is required by law.

Some prudent corporations no longer build environmental control systems just to meet current standards. They anticipate the public's demand for tightened pollution standards and prevent future problems by building in higher standards initially. This is to be encouraged, but the regulatory approach as it is presently implemented seldom provides a direct incentive for industry to do better than standards require.

Regulation in a Broader Context

Steady improvement in the safety and health of our population is vital to a higher quality environment. To achieve this, some adjustment to the normal regulatory practices will be necessary to keep industrial decision makers hunting for improvements in their 4R systems (mentioned on page 26) and waste management technology.

Our proposal is to view regulations as the essential tool of last resort. Regulation is the backstop that keeps those few "bad apples" in the industrial basket from harming societal interests. (See, for example, *Resolving Conflict: A Case Study* [Lilley 1988], one of the ACS project's sector discussion papers, for an excellent treatment of both the role of regulation, and the practical means by which to improve outcomes for everyone at least cost.) The draft ACS strategic framework provides a menu of choices to policy makers, based on a hierarchy of "most preferred" to "least preferred" alternatives. In order of preference (and ease of implementation) they are:

1. Information, Education, and Understanding. These encourage a voluntary change in behavior. For example, a recycling program may succeed simply by providing information that persuades people to participate. An industry may clean up its site because nearby residents suggest it during an "open house." A joint project to treat similar industrial and municipal waste may be arranged to the benefit of both (such as the town of High River and Cargill Ltd., who, along with Ducks Unlimited, are sharing resources to treat waste while improving wildlife habitat). These are the preferred methods, and they often require government to do nothing more than monitor, facilitate, and sometimes act as broker among the parties. Occasionally existing government regulations and red tape must be removed to allow innovative solutions.

2. Incentives and Disincentives. The taxation system, provincial royalty structures, loan guarantees, grants, transportation subsidies, and hundreds of other incentives and disincentives pervade every aspect of government, industry, and society. This

intricate system results from incremental, single-sector decision making and badly needs to be evaluated to determine its compatibility with sustainable development goals. In most cases, new financial incentives are not necessary; the withdrawal or redirection of counterproductive policies and programs may guide many economic activities in sustainable directions. Sustainable development should, in most cases, cost the taxpayers notably less than continual support for inherently unsustainable economic activity. Costs to taxpayers can be reduced in two ways: reducing subsidies to unsustainable activities, and avoiding the longer term costs of cleaning up the environmental and social consequences of such subsidies.

In addition to financial instruments, many forms of incentives and disincentives can be applied without major spending or taxation programs. Widely publicized awards, such as the provincial Order of the Bighorn and the Environmental Achievement Awards, can encourage environmentally sound activity by individuals, corporations, communities, and governments. The thousands of individual Albertans and their families who implement the concept of sustainable use of resources in their daily lives should also be recognized in some general way.

3. Legislation, Regulation and Enforcement. It will always be necessary to have high standards of pollution control backed up with clear regulations, strict enforcement, and severe penalties. But the goal of the Alberta Conservation Strategy is to direct societal efforts toward anticipating and preventing environmental problems *before* legislative and regulatory action is necessary (Crerar 1986). As described above, regulatory systems are by nature a "react and cure" method of operation. For an anticipatory system to work, industry, municipalities, and individuals must be absolutely convinced of the certainty and severity of the consequences of violating the regulatory backstop.

Table 2 shows an example of the three types of policy instruments as they would be used in seeking sustainable development through the draft Alberta Conservation Strategy.

A rejuvenation of the regulatory system may depend on some mechanism that provides continuous (but not necessarily onerous) pressure to gradually reduce pollution. Some form of environmental-cost thermostat should be created that will provide the clear, long-term financial incentive that is necessary for steady technological development in the pollution control business. Marketable emission permits, pollution offsets, noise charges, and many other innovative ideas are in practice elsewhere, and others are recommended by ecologists, economists, and others who recognize the natural power of market mechanisms bounded by

Table 2. An Example of Three Kinds of Approaches to Sustainable Development

Objective 4: To provide for the recreational, spiritual, aesthetic, and other non-material needs of Albertans by maintaining and developing diverse opportunities for the use of natural resources.

Aim: To promote understanding, appreciation, and appropriate use of the natural and cultural heritage of Alberta.

Information Approach

Three permanent chairs of study should be established at one of the major universities in Alberta to conduct research and to train students for park management, including subject areas like tourism and visitor services management.

Incentive Approach

Funds from the five percent accommodation tax levied by the Alberta Government should, in part, be used to fund tourism research and promotion and to improve the directional and interpretive signage systems throughout Alberta.

Legislation Approach

Alberta Culture and Multiculturalism should be given the mandate to relocate and reconstruct historical resources having significant potential for tourism development when such resources are in danger of destruction by industrial, commercial, or other developments.

governmental guidelines. "Polluter pays" is the basis for these techniques. The goal of these innovative systems for pollution control is to enable government to "set the pollution thermostat" and let those who pollute find the best ways to meet the thermostat setting. The time has come to examine these alternatives to our present system for their applicability to a sustainable future in Alberta.

Regulatory structures have three purposes in a Conservation Strategy:

a) to provide a steady pressure for improvement beyond what is required

b) to allow consistent and clear promulgation, measurement, and enforcement of standards, leading to achievement of the goals established for the regulations

c) to make themselves obsolete (or irrelevant) because compliance has become part of the financial planning routine of business.

Measuring Sustainable Development

The greatest challenge presented to those who would implement sustainable development is to decide how to measure it. It is often said that "what gets measured, gets done." Measurement is necessary to know whether our policies are leading to more sustainable use of resources or less, and the relative cost of various ways to implement sustainable development. It is time to begin measuring somewhat different things than we have heretofore.

How will we know sustainable development when we see it? Much time and energy can be wasted trying to define a concept that is more importantly a call to action. Agreeing on a definition doesn't count nearly so much as making progress; in this case, the path (our actions) is the solution. How we live our daily lives, how policy and programs of government are formulated and applied, and the way we conduct business affairs are the real test and proof of sustainable development.

Because the future is uncertain and many factors are out of Alberta's direct control, the means we use to achieve sustainable development are of critical importance. A Strategy has to remain flexible and able to adapt to the unexpected changes the future will bring. The approach we have taken defers the technicalities of determining specific operational indices for everything we do. This level of detail, if required, will evolve in response to the general principles we have described, just as valid economic and accounting measures were gradually determined over time.

As recommended in the Report of the National Task Force on Environment and Economy, we need new economic and accounting tools to improve decision-making. These new techniques are being developed in many places around the world, and are likely to become mainstream economic principles in the next decade. For now, we need to begin to implement sustainable development in Alberta, and to do that we need some guidelines and a framework within which to work. The draft Alberta Conservation Strategy provides that framework.

Who Pays For Sustainable Development?

While futuristic ideas about intensive food production, infinite non-polluting energy production, increased housing density, colonization of other planets, and so on have some value, we must also be realistic; the best future we can probably hope for is to reduce entropy by managing our natural, human, and economic resources as efficiently and democratically as possible. As with generations before us, this is the best way to ensure that the generations to come have the opportunity to meet their economic and social needs from a healthy resource base.

But there are always costs associated with development and use of natural resources; nothing is "free" and someone, somewhere, sometime will have to pay. Presumably there are also benefits from development activities or they would not be undertaken. Historically our society has taken the "CC-PP" approach (Hardin 1985); that is, Commonize Costs and Privatize Profits. When the expense of doing business is spread over a large number of people and everybody, knowingly or not, pays a small amount, it is much easier to hide the true costs. Payment has been extracted in many forms: gradually declining health in the case of miners, loss of local tourist revenue from despoiled landscapes, increased costs to treat urban water supplies downstream of polluters, and lower quality agricultural land due to acid deposition. These are examples of what are referred to euphemistically as "externalities" — costs "external to the accounting books of the firm producing the pollution" (Hardin 1985: 110). A fundamental of sustainable development is that externalities of development should become "internalities" — that is, the cost of development should accrue to those who reap the benefits.

Subsidy, too, "is one of the disguises of commonization" (Hardin 1985: 109). When subsidies are offered, a few people or groups benefit while taxpayers as a whole must pay, through their income and other taxes. But every individual's contribution is relatively small, and governments have realized that if subsidies can be provided in some way to a number of segments of the population, then no one is likely to complain. The question then becomes "is this an economically sustainable approach?" In the long run, development must be sustainable economically as well as environmentally.

The market processes of "creative destruction" must be allowed to work in transforming our economic base from raw resource extraction to a diverse, efficient, pollution-minimizing, and high value-added economy suitable for the 21st century. Too often, subsidies provided to tide an economic sector over a period of difficulty

become long-term support programs that hold the entire process of economic development to ransom. Supporting inefficient, obsolete, or polluting industrial processes with no incentives to improve may condemn an economy to stagnation and decline. It has never been more critical for us to pay attention to the sustainability of economic activities, as the world economy changes and the financial resources available for subsidies continue to diminish.

Part II
Strategy for Action

Chapter Four

Required Processes

"Everything is connected to everything else. (You can't do merely one thing.)"

Wide-ranging and significant change is required in the way our (both Canada's and Alberta's) economic and environmental programs are planned and implemented if the goal of sustainable development is to be achieved. In Alberta, government initiates many of these programs, which is perhaps not surprising given our heavy reliance on natural resources and our large amount of Crown land, both of which are under the Province's jurisdiction. Government therefore must lead responsibly in resource management and development. Industry too has an important role to play, and meshing the interests, strengths, and responsibilities of the public and private sectors to achieve sustainable development will be an evolving challenge.

Accountability

The need for better integration and collection of information during planning and development processes is apparent. If this need is to be met, responsibility for the environmental impacts of development projects must be ingrained within the originating department or agency. This means that departments of forestry, energy, public works, economic development, tourism, or any other department that initiates a development proposal should be responsible for ensuring that environmental conservation and protection are part of the plan. Environmental and economic consequences of the development should fall to the initiating department, whose Minister and departmental

advisors should be directly accountable. This is precisely what the National Task Force on Environment and Economy (1987) had in mind when it recommended that "All Ministers must become directly responsible and accountable for the environmental and economic consequences of their policies, legislation, and programs" (NTFEE 1987: 8).

Experience has shown that the policies and programs with the greatest chance of success are those that adhere to the principles described in Chapter 5 and that follow the precepts outlined above. Pro-active departments and agencies in Alberta have undertaken interagency review, along with meaningful public review at a time in the process when suggestions can still be incorporated, with notable success. But the notion of installing accountability for the environmental impacts of development projects within the originating department is new. There is, however, no reason why this cannot be done. Such a step would represent a sincere commitment to environmental protection by all of government.

A strict financial accountability helps to ensure that money is not stolen; likewise a strict accountability for achieving explicit goals of sustainable development in Alberta will ensure that our province remains the kind of place we wish to call home. Only the people of Alberta can judge the validity of the goals, and most important, the methods we should use to reach them. But once these methods and goals are agreed to, clear lines of accountability and achievement-oriented measurement instruments can be put in place.

Cross-sectoral Management

While many people are aware of the need to strive toward sustainable economic development, efforts have fallen short, for various reasons, foremost among them the difficulty of cross-sectoral management:

> *[T]he greatest weakness in these efforts has been the sectoral approach to planning and development. This is starting to change, but the process must be accelerated....* (NTFEE 1987: 3).

Environmental affairs cut across the boundary between the public and the private sector and through departmental boundaries in each of these sectors. Even so, policy decisions at all levels are commonly made in a setting where the interdependence of ecology and economics is ignored and strong sectoral interests dominate the debate. As the Brundtland Commission and others have pointed out, those with responsibility for the environment are often administratively isolated from those who manage development.

Some Examples of How to do it Right

Alberta has several good examples of policies and programs that adhere to most of the principles described in Chapter Five: the public was involved in a meaningful way, and there was interagency participation and review early in the process. The best examples of these activities also recognize that ongoing change and modifications are necessary to make a good approach even better.

Energy Resources Conservation Board

The Energy Resources Conservation Board has been an Alberta leader in handling energy resource development and responding to changes needed to improve their processes. The Board's open and willing participation with industry, government, and environmental groups to address differences is well-known. Yet the Board continues to look at new ways to resolve conflict and ensure that Alberta's energy resources are developed in an environmentally and economically responsible manner.

Swan Hills Hazardous Waste Treatment Facility

Alberta has demonstrated national leadership in waste management too. The Swan Hills plant is unique in Canada, and was constructed only after considerable widespread input from the public as well as government and scientific experts. Alberta's recycling policies and programs are among the nation's best, with our system of returnable containers, provincial and community support for a variety of projects, and the recently instituted curbside collection of newspaper, cardboard, glass, plastic, and metal in Edmonton. Both these achievements benefited from the broad public consultation, input, and consensus of public hearings conducted by the Environment Council of Alberta.

Prairie Conservation Action Plan

The recently released Prairie Conservation Action Plan was undertaken with support from three provincial governments, the federal government, several non-government agencies, and private landowners. The draft plan was subjected to wide-ranging reviews, then revised in light of excellent comments from many sources. The process began by obtaining consensus on the basic fundamental objectives, then building on these points. It now remains to implement the plan with solid on-the-ground actions that can be taken by those who are directly involved in managing the resources.

Under these circumstances, resource decisions can be technically sound within one sector yet have calamitous consequences for other sectors.

Compartmentalized responsibility leads to fragmentation and duplication of effort, poor co-ordination, confusion, "turf" protection, and significant misuse and squandering of valuable time and money. The old axiom of ecology — everything is connected to everything else, and thus we can never do merely one thing — contains a great deal of wisdom for those responsible for resource conservation and development.

Proponents of a development should be encouraged to consult widely and early with other departments that may be affected by the development (one effect of clarifying accountability). Having the opportunity to provide input ahead of time would allow departments to get many different ideas and approaches out on the table for discussion. Early interagency review would increase the efficiency with which new programs are administered and greatly reduce unexpected socioeconomic and environmental effects. The National Task Force on Environment and Economy suggested this could be accomplished by:

> *Ensuring that all government processes for screening, review, and evaluation of economic development projects include both socioeconomic and environmental criteria; and ensuring that every major report on economic development, and every related cabinet document, demonstrates that the proposal or activity is economically and environmentally sound* (NTFEE 1987: 8).

To help integrate these decisions at the highest level, the Task Force also recommended that

> *Environment Ministers should be members of key economic development and priorities and planning committees of cabinet, or be closely associated, by appropriate mechanisms, with these committees* (NTFEE 1987: 8).

At the same time, the Task Force urged that specific steps be taken "to open environmental, resource and economic development policy making and planning to greater public input" (NTFEE 1987: 8). A public that is increasingly knowledgeable and better informed about environment and development issues expects to be consulted about decisions that will affect their environment, their health, their pocketbooks, or their children. Here, too, planned, meaningful consultation and participation with interested or affected parties is an essential part of the decision-making process.

Anticipating various problems and building in solutions in response to input from interested and affected parties also is likely to engender much greater support for the project. This focus on the interactions among sectors can not only help to avoid unintended

consequences, but can help to develop the synergy needed to sustainably develop several sectors at the same time. The background sector papers prepared as part of this project emphasize this vital linkage of economic sectors with each other as well as with the environment of Alberta.

In essence, development that is little influenced by ecological considerations seldom makes the best use of available resources, and will usually damage the economy as well as ecosystems and society. The most effective way for society to avoid such problems is to integrate every stage of the conservation and development processes, from the initial setting of policies to their eventual implementation. If the objectives of conservation are to be achieved, governments need to dispel any notion that conservation is a limited, independent sector largely concerned with wildlife or soil. Ecological factors can no longer be treated as impediments to development that may be safely overlooked or merely considered on a project-by-project basis rather than as matters of basic development policy.

Such a shift in thought and action is not easy, and in some cases, may not be possible. Most decisions are like pebbles tossed into a pond: they make ripples until at some point distant from the original action, the effect is insignificant. To try to take all effects into account would be unrealistic, and a process that attempted to do so could be more stifling, ineffective, and costly than ignoring the ripples entirely. On the other hand, some decisions are like throwing boulders into the pond; the ripples become waves to those who bear the consequences.

Yet there is a balance that must be struck between considering these other effects and the cost and effort required to do so. The Brundtland Commission recognized that this point lies well beyond our current narrow approach to decision making (WCED 1987).

Learning From Uncertainty

To fully appreciate the impact that policies and investments have on the natural resource base, it is necessary to follow up and evaluate previous and existing programs. Information is rarely assembled and used to determine, after the fact, whether the original predictions of benefits and costs came to pass, if the data used to make the decisions were accurate, or if the impacts were anticipated and effectively dealt with. Each local, regional, and provincial government agency should consider allocating some resources to

a careful study of the total results of previous programs and projects. The results should be compiled in a casebook for evaluating future projects. What worked, what didn't, and why; what is the difference, and what is the same?

A ruthlessly honest evaluation is the only way to learn. Personal blame should have no place in such an exercise in hindsight. Decisions made correctly in historical context should never cause embarrassment if they are later shown to have led to serious problems — alternative decisions would also have led to consequences (perhaps much worse). The point is to find patterns and situations that can guide future decisions based on the uncertainties and limited information that always face us in the present.

Being defensive and over-protective of our past decisions that didn't work out perfectly is one of the greatest barriers to human learning and development, world-wide. We all face unfair criticism of decisions from those who have incomplete information or are ignorant of the historical context. Criticism comes with the responsibility for making important decisions in the first place. It's part of the territory. Trying to save face by avoiding responsibility, accountability, and evaluation is no different from the student who pretends the report card was lost on the way home from school. Perhaps it's time we recognized that we are all imperfect, mortal beings, and *none* of our previous decisions or actions were perfect. The best we can do is make our best judgement based on the information available at the time.

Some people will claim it is wasteful to use valuable resources to look backward at work already completed. This is entirely incorrect. A task is never completed until a careful assessment of the work done has provided all the lessons for the future that can be gleaned from the experience. Rather than wasting resources, retrospectives are the only effective method to ensure our present and future resources are not squandered.

These processes represent better ways of doing business that will be necessary to implement a conservation strategy for sustainable development. They complement fully the principles and strategic framework described in the next chapter, providing valuable guidance and clear direction for improving our decision-making processes.

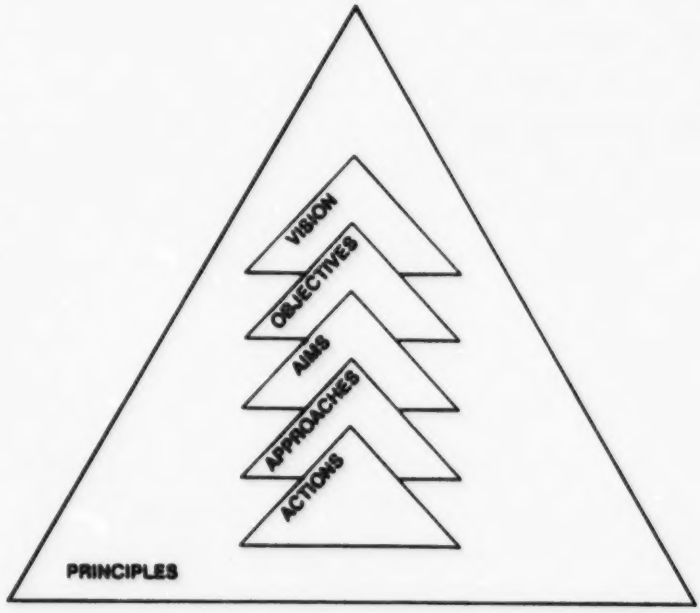
Chapter Five

A Structure For Sustainable Development

"By changing the way decisions are made, you change the decisions that are made."

The central point of the Alberta Conservation Strategy project is that a logical and practical method is needed to test whether economic and environmental decisions will lead to sustainable use of the biosphere. The method we have developed for the draft Alberta Conservation Strategy is to evaluate decisions within a strategic framework, which is shown graphically below.

A Strategic Framework for Sustainable Development



The framework is to be used in the context of ten principles, which guide the decisions made within the framework. All of the steps within the framework must be consistent with all of the principles. The framework provides a *principled* structure for making decisions that will take us toward sustainable development in Alberta.

Why A Strategic Framework?

Making development sustainable environmentally and economically is a complex matter, yet action is needed now to prevent unforeseen disasters. Some guidelines for action that will be broadly supported are urgently needed. They must be relatively simple and practical, allow for the widest possible application, yet clearly guide us in the general direction of sustainable development — a tall order.

This strategic framework is provided for Albertans to examine and discuss. We believe that this framework, if applied flexibly but continuously, will lead toward sustainable environmental and economic development in Alberta. Detailed measures of progress, accountability, and responsibility will be needed at the "action" level of implementation. These will take time to develop. But we do not believe that inaction due to a lack of technical measurement indicators is justified. Often such complexity of detail is used as an excuse for the status quo, or for inaction. In the important matter of our future and the sustainability of our activities in this province, excuses for inaction are unacceptable.

A Strategic Framework for decision-making may seem new, and in some ways it breaks from past practices. It is not new. The Strategic Framework represents little more than an application of common sense and sound business management practices and principles. But in this case we apply common sense to the essential matter of putting Alberta on a sound environmental and economic base. Most important is that this framework be *used*.

So many simple ideas and management practices that are sometimes called "platitudes" or "motherhood statements" are not applied in the real world. If they were, our world would be different and better. Our expectation is that the application of this Strategic Framework will improve the quality of decisions that are made. *By changing the **way** decisions are made, you change the decisions that are made.* For sustainable development to become a reality, different

decisions will have to be made. Our methodology presents some practical alternatives to improve the decision-making process.

The elements of the framework provide a common ground from which Albertans can more easily discuss specific approaches and actions to implement sustainable development. The framework narrows the focus of discussion so that specific actions affecting resource management, the environment and economy, and the quality of life in the province can be addressed in an orderly manner.

The breadth of this subject matter is too vast to assimilate unless it is broken into smaller pieces. However, dealing with one piece at a time often leads to compartmentalization, poorly coordinated decisions, and a crisis management atmosphere. The strategic framework allows us to concentrate on specific actions without losing sight of our overall goals, to keep our eye on the ball and swing hard, while not losing track of the game plan or the score.

Using A Strategic Framework

The Strategic Framework has a hierarchical structure, which can be viewed from the top down or the bottom up. Either way, the framework leads us through a step-by-step operation. Beginning at the top, there is a vision statement. Next are six objectives necessary to reach that vision. Then come more specific aims, and following them are approaches to achieving the aims. Finally, there are the actions needed to accomplish each approach. To use the framework, whether from the bottom up or the top down, any proposed decision should be examined for congruence with each level of the framework in turn.

For the vision or any objective, aim, approach, or action to be valid and acceptable, it must not contravene any of the ten principles for sustainable development (see page 48). The principled structure retains flexibility of action, however. For example, each approach or action may not wholly encompass each principle, but should not actively violate the meaning of any principle. Without these principles, almost any activity could conceivably be put forward as "sustainable development." By actively applying these principles to each proposed action, and ensuring each action is in keeping with the overall strategic structure, we can increase the

Principles for Sustainable Development

1. Manage all resources for sustainable use. For non-renewable resources, this means using and managing them so they contribute to environmental and economic stability and sustainability (for example, investing provincial royalties from non-renewable resources in renewable resources, education, research, substitute products, and alternative industries).

2. Where possible, encourage environmentally sound renewable resource development over exhaustible non-renewable development.

3. Keep options open so as to retain the flexibility to deal with an uncertain future.

4. Integrate as much information as possible in planning and managing resources.

5. Focus on causes as well as symptoms, and mix cure with prevention.

6. Find common ground. At least know the extent of your agreement before disagreeing.

7. Look first to existing institutions and processes when building improvements to resource management systems.

8. Recognize that fairness and justice are essential to lasting change.

9. Build in mechanisms for evaluating both progress toward reaching goals and the costs of doing so.

10. All interested parties should be identified and involved to the greatest extent possible and as early as possible in the policy development process as well as in the planning of development projects.

Using The Strategic Framework From The Bottom Up

Let us take the example of someone with an idea about how five person-days' work could improve the spawning grounds for an important species in a small stream near her home. The initial questions would involve whether the **action** would accomplish one of the **approaches**, or if a new approach regarding spawning fish should be created. For example, in most cases maintaining the natural productivity of a stream is preferable to allowing a stream to degrade and then stocking expensive hatchery-raised fish each year. There is no approach to deal specifically with this issue, but the proposed action clearly addresses Objective 3, Aim A:

> *To protect, maintain, and enhance Alberta's fish and wildlife populations while providing continuing opportunities for consumptive and non-consumptive uses.*

so the action fits well within the strategic framework. Another approach to sustainable development has potentially been uncovered, which would possibly be useful in other situations. But further testing of the idea is necessary.

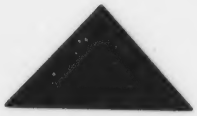
What if the five days of work involve fencing the stream, preventing cattle from drinking? What if five days' work will lead to extensive maintenance requirements over the next twenty years? What if the enhanced spawning habitat is periodically dry during the spawning season? What if enhanced spawning success for that species may result in serious decline in other desirable species? The fact that the action can be justified within the strategic framework does not *necessarily* mean the five person-days of work will result in a more sustainable situation.

We then ask whether the proposed action contravenes any of the 10 principles. Principles four, six, eight, nine, and ten are probably the limiting factors. A short discussion among those responsible for fisheries management, combined with phone calls to local land holders, the local fish and game association, and other interested parties in the area should determine if there are reasons for a meeting about the proposal. Using local knowledge of the stream combined with the expertise of both local people and professionals will increase the chances of success by allowing decision makers to anticipate potential problems and prevent them.

probability that the recommended action will lead toward sustainability rather than away from it.

If using the principles as a checklist prior to making a decision sounds too complicated or time consuming, think about the many examples where action has been taken that has led to lengthy conflicts and animosity because these simple principles were skipped. Five person-days' work, if it has the unintended consequence of creating local conflict, can cost dozens, or even hundreds of wasted person-days trying to remedy the situation. Local conflict is the most unsustainable development of all, and the reason for *using* the strategic framework.

The Strategic Framework in Detail



The strategic framework we propose is based on the consensus we have built over the past five years. It begins with a **vision**: we shall leave the province a better place for our having been here. That means treating Alberta as if we plan to stay, thereby ensuring that future generations of Albertans have a high quality environment in which to live and work. But to fulfill this vision, we need some benchmarks — targets to aim for and ways to measure progress toward achieving our goals.

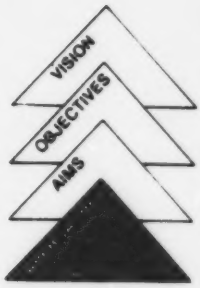
Setting ***objectives*** forces us to decide what things are truly important to us, and how each of these important matters relates to the others. By making objectives explicit we can begin to measure progress toward them, and to hold accountable those charged with achieving them.

The objectives are intended to make development sustainable and improve our quality of life, two essentially human-centered goals. But humans are obliged to act conservatively in the interests of other species too. Human beings have become an evolutionary force on the planet and the obligations that come with this power are reflected in the objectives. Power must be tempered with prudence if our species, and others, are to have a future.

The next stage is an intermediate step to connect these broad objectives with the concrete actions needed to move toward sustainable development. A series of ***aims*** was designed to pinpoint key resources, actors, and activities in our province (a complete listing of the objectives and aims is provided on pages 55 to 60). The

aims were developed through consultation with government, non-government organizations, and individuals.

The 44 aims set the stage for the specific, content-oriented material that some people consider to be the core of the draft Strategy. The aims provide the guidelines that will direct Alberta toward sustainable environmental and economic development.

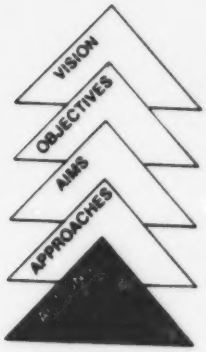


The vision statement, objectives, and aims increasingly focus our attention. But two more levels are required to actually achieve the aims and ultimately the objectives: first is a series of ***approaches***, suggestions for implementing sustainable development by achieving the aims. Extensive public consultation is essential to determine the most suitable approaches and subsequent actions.

Many approaches to reach the aims are possible. Because there are so many potential approaches to implementing sustainable development, they can be categorized into three general types. (These three categories of policy instrument are described in Chapter 3.) They are broadly defined as:

1. Information
2. Incentives
3. Legislation

Approaches begin to imply direct activity in the real world, and thus require more rigorous measurement indicators to determine the extent to which each approach represents sustainable development. Application of the ten principles will help to direct the approaches toward sustainable development, but further measures of accountability, costs, and benefits will also be required (see page 34). Principle nine, concerning the need for evaluation, should be an important factor in developing and refining approaches.



As consensus is reached about an approach, ***actions*** will be derived to accomplish the intent of that approach. Each action must also be tested against the ten principles. As the actions are refined, more specific measurements should be developed to ensure each action is consistent with an approach, aim, objective, and the vision statement, and thus with sustainable development in Alberta.

Each action should be measured for environmental and economic sustainability, and responsibility and accountability must be clear. Precise measurements of progress, costs, benefits, and alternatives fall largely to those most directly involved in taking the action.

The public service bureaucracy in the case of government, municipal administrators in the case of communities, and departmental directors and field-level managers in the case of corporations each would be primarily responsible for measuring sustainability in their activities, just as these same individuals now have responsibility for effective achievement of their other goals. However, principle ten, dealing with public consultation and participation, is essential to ensuring the right action is taken.

Examples of the five components of the strategic framework for the draft Alberta Conservation Strategy — vision, objectives, aims, approaches, and actions — are summarized in Tables 3A and 3B. The ten principles must be applied at every level.

Table 3A. The Strategic Framework in Detail

	Role Played In ACS	Indicators of Achievement	Who Accountable For	Lifespan	Applies to	Example: Objective 1
Vision	Provide overall direction: to seek a sustainable future	Public consensus	Every Albertan. Government plays key role in expressing the will of the people	Continually evolving	Province as part of globe	Let's leave Alberta a better place for our having been here
Objectives	Provide a framework, based on six major subject areas, for developing abstract vision	Indicators of quality of life, biological diversity, percentage of life spent in good health, other objective and subjective indicators	Every Albertan. Experts, government, specialists make key contribution	Reexamined in light of new knowledge	Province	To maintain essential ecological processes and life support systems on which human survival and development depend
Aims	Fill in framework by pinpointing key resources and activities where change needs to be effected	Indicators of quality of life, biological diversity, percentage of life spent in good health, other objective and subjective indicators	Varies according to approaches and aims	Reexamined in light of new knowledge	Province	To reduce the quantity and toxicity of chemicals used in Alberta and to facilitate the safe use, transportation, and disposal of dangerous goods and toxic wastes
Approaches	Suggest practical, implementable ways to make changes in key resources, actors, or activities	Effective public policies and practices exist	Societal institutions: industry, government, interest groups	Specific target dates for implementation and evaluation	Specific ecoregions, including urban environment; some at provincial level	The Government of Alberta should continue to develop its hazardous waste management system and should strictly enforce legislation related to the production, movement, use, or disposal of hazardous wastes
Actions	Achieve intent of approach while providing the flexibility needed to allow field-level decision making	Reporting provisions in public policies; individual responses consistent with letter and spirit of public policies; changes in corporate actions	Public administrators, e.g. bureaucrat, educator; corporate policy makers; individuals, etc.	Specific dates set for each specific policy instrument	Specific situation	Establishment of safe, convenient collection points for hazardous wastes

Table 3B. Examples of Objectives, Aims, Approaches, and Actions

Objective*	Objective 2: To preserve biological diversity	Objective 3: To achieve sustainable use of species and ecosystems	Objective 4: To provide for the recreational, spiritual, aesthetic, and other non-material needs of Albertans	Objective 5: To maintain and improve the quality of life in the urban environment	Objective 6: To use and manage our non-renewable resources in the interests of developing a long-term sustainable economy for Albertans
Aim	To restore populations of threatened and endangered native species to levels that will ensure their survival without assistance in their natural habitats.	To practice agriculture in a manner that ensures the industry's present and future environmental and economic viability.	To promote understanding, appreciation, and appropriate use of the natural and cultural heritage of Alberta.	To provide safe and environmentally sound sewage and waste management services and other infrastructure, including transportation.	To improve efficiency in the extraction, production, processing, transportation, and use of non-renewable energy.
Approach	Alberta Forestry, Lands and Wildlife should complete and implement management plans for all threatened and endangered species in Alberta.	Lands unsuitable for agricultural cultivation should be converted to forage crop production.	Three permanent chairs of study should be established at one of the major universities in Alberta to conduct research and train students for park management, including tourism and visitor services.	Every community should have a comprehensive recycling program for glass, paper, plastic, metal, and biodegradables in place by 1994.	All major industrial plants should conduct energy audits and implement programs to improve energy use efficiencies.
Action	Management plans for at least four species per year should be completed, with those species most threatened being done first.	Alberta Agriculture, Alberta Economic Development, and grower associations should prepare a marketing plan for increased forage production by 1992.	Ten percent of the accommodation tax now imposed in Alberta should be designated to support these chairs of study.	The Alberta Urban Municipalities Association and Alberta Environment should conduct an intensive workshop/meeting by the end of 1990 to provide information on costs, markets, options, and other important topics to municipal councils and administrators to help them establish the best approach to a recycling program for their community.	Switches should be installed in each work area so lights can be turned off when the area is not in use.

* Note: Objective 1 appears in the last column of Table 3A.

OBJECTIVE 1

To maintain essential ecological processes and life support systems (such as soil regeneration and protection, recycling of nutrients, and the cleansing of waters) on which human survival and development depend.

This objective focuses on pollution or environmental degradation that interferes with natural processes and damages life-support systems — in other words, human activities that impair nutrient cycling, decomposition and regeneration processes, lead to air and water pollution, and so on. The purpose of the aims is to maintain and enhance these natural processes on which we depend. This objective is targeted at the components of an ecosystem (air, water, and land processes) rather than the whole ecosystem and the activities it sustains.

Aims

A. To protect, maintain, and enhance the quality and quantity of Alberta's water bodies, enabling them to support indigenous species and provide high quality water.

B. To protect and enhance the quality and protect the supply of Alberta's groundwater to maintain its vital role in the hydrologic cycle.

C. To maintain and improve ambient air quality so that it does not adversely affect plants, animals, and human health.

D. To protect, restore, and enhance the inherent ability of Alberta's soils to support native plant communities and cultivated crops.

E. To reduce the quantity and toxicity of chemicals used in Alberta, and to facilitate the safe use, transportation, and disposal of dangerous goods and toxic wastes.

F. To reduce Alberta's contribution to atmospheric change by reducing the province's output of CO_2 and other gases that contribute to the "greenhouse effect" and depletion of the ozone layer.

OBJECTIVE 2

To preserve biological diversity (including the range of genetic material found in the province's organisms) on which depend the functioning of many essential ecological processes and life-support systems, the research necessary for the protection and improvement of cultivated plants and domesticated animals, the micro-organisms so vital to our survival, and the security of the many industries that rely upon living resources.

Aims

A. To preserve and protect adequate tracts of representative and special land-based and water-based ecosystems and connecting corridors, and their associated biological diversity.

B. To restore populations of threatened and endangered native plant and animal species to levels that will ensure their survival without assistance in their natural habitats.

C. To ensure retention of diverse genetic material useful in the production of domesticated plants and animals in Alberta.

D. To ensure that industrial development and other human activities in Alberta work in harmony with biological diversity both in Alberta and beyond its boundaries.

E. To ensure that forest management practices maintain or improve the richness of plant and animal communities in Alberta.

F. To ensure that agricultural practices in all regions allow for the continued existence and diversity of native plant and animal communities.

G. To ensure that natural landscapes and the biological diversity they support are protected in urban areas.

OBJECTIVE 3

To achieve sustainable use of species and ecosystems (notably fish and wildlife, forests, agricultural soils, and grazing lands) some of which support important industries (tourism, forest products, agriculture).

This objective deals with human use of species and ecosystems. Sustainability requires sound, long-term use and management from both the environmental and economic points of view. The aims address both the economy and the environment as they affect and are affected by human use of species and ecosystems.

Aims

A. To protect, maintain, and enhance Alberta's fish and wildlife populations while providing continuing opportunities for consumptive and non-consumptive uses.

B. To maintain high quality environments for land- and water-based recreation and tourism and to ensure that these activities do not degrade the environments on which they depend.

C. To ensure that Alberta's forests are used and managed in a manner that sustains the full range of products, uses, and benefits that forests provide.

D. To practice agriculture in a manner that ensures the industry's present and future environmental and economic viability.

E. To ensure the sustainability of indigenous plant and animal species in areas where native rangelands are used for domestic grazing.

F. To maintain wetlands of sufficient diversity, quantity, and quality to provide a range of benefits, including replenishing groundwater and maintaining habitat for sustainable fish and wildlife populations.

G. To ensure that institutional and economic structures and processes facilitate the allocation or reallocation of land and water resources to uses that can be sustained over the long term.

H. To ensure that natural resource allocation decisions and publicly funded programs for one sector or resource use minimize damage to the productivity and sustainability of other sectors.

I. To diversify the economic base of the province so that short-term economic fluctuations that adversely affect sustainable development policies are minimized.

OBJECTIVE 4

To provide for the recreational, spiritual, aesthetic, and other non-material needs of Albertans by maintaining and developing diverse opportunities for the use of natural resources.

Aims

A. To ensure continued opportunities for a variety of nature-oriented outdoor recreation experiences in each of the natural regions of Alberta.

B. To promote understanding, appreciation, and appropriate use of the natural and cultural heritage of Alberta.

C. To ensure preservation, restoration, and presentation of representative examples of Alberta's cultural heritage resources.

D. To ensure co-ordinated participation of all levels of government, the private sector, and volunteers in the protection and preservation of natural and cultural heritage, and in the delivery of related recreation and tourism programs.

E. To facilitate public recreation access to private and Crown land that values the capability and sensitivity of the land and associated resources, as well as the rights and responsibilities of landowners and disposition holders.

F. To ensure the maintenance of aesthetically pleasing natural and cultural landscapes and surroundings in rural and urban areas throughout the province.

G. To ensure the provision of a wide spectrum of land- and water-based recreation opportunities for Albertans and tourists, including areas in and adjacent to urban places.

H. To ensure that planning and development activities can accommodate the non-material needs of a changing population of Albertans and tourists.

OBJECTIVE 5

To maintain and improve the quality of life in the urban environment, where the majority of Albertans now live and work.

Aims

A. To ensure safe, adequate supplies of water for domestic use for all communities.

B. To ensure steady improvement of ambient air quality in urban places so that human health, living plants and animals, and buildings and other structures are protected.

C. To ensure the quality of indoor environments is improved, making them healthy and pleasant places in which to work and live.

D. To reduce noise levels and their harmful impacts in urban places.

E. To protect and expand open spaces in and adjacent to urban places, and improve public access and integration of these spaces with surrounding neighborhoods.

F. To provide safe and environmentally sound sewage and waste management services and related infrastructure, including transportation.

OBJECTIVE 6

To use and manage our non-renewable resources in the interests of developing a long-term sustainable economy for Albertans.

Aims

A. To ensure that the use and management of resources exported beyond the boundaries of Alberta are included with in-province uses in developing overall management strategies.

B. To ensure that the institutional and economic structures in Alberta facilitate the allocation of non-renewable resources to uses that provide the greatest benefit in the long term.

C. To ensure that resource allocation decisions to expand one sector or resource use, including urban development, minimize limitations on the future extraction and production of non-renewable resources.

D. To ensure that sites disturbed by non-renewable resource development are reclaimed in a manner that will produce sustainable benefits for society, or that they at least do not represent an ongoing net cost.

E. To improve efficiency in the extraction, production, processing, transportation and use of renewable and non-renewable energy.

F. To encourage the development of environmentally sound renewable energy sources to extend the duration of use and income from Alberta's non-renewable energy sources.

G. To ensure that strategies for least-cost energy, including all social and environmental costs, are considered in developing Alberta's energy supply systems.

H. To ensure efficient use and encourage recycling and reuse of non-renewable and renewable resource materials and their byproducts.

Chapter Six

The Final Chapter

"And the last shall be first."

The last chapter in developing a Conservation Strategy for Alberta is up to you, the people of Alberta. This draft Conservation Strategy was developed from supporting material prepared by people just like you. These volunteers have contributed thousands of hours of effort to the background sector reports, What I Can Do for the Environment checklists, and this draft Framework. Now it is for you to discuss and decide where our common future lies. We present this material to help all of us judge what direction we should take for our future in Alberta.

Our materials offer something for everyone:

- Our What I Can Do for the Environment checklists provide simple, everyday suggestions for improving the environment and can be undertaken by individuals, families, schools, communities, or in workplaces.
- The strategic framework offers a generic decision-making system to incorporate sustainable development into our lives, at home and at work.
- The sector discussion papers provide enough in-depth information to satisfy Albertans who want to take a serious look at the interaction of one sector with another.

Taken as a group, we believe this package is a comprehensive examination of the future of the environment and economy in Alberta.

The single most important item in this draft Strategy (the document you are now reading) is the strategic framework offered in Chapter Five. If the purpose of this

framework — to incorporate ten principles of sustainable development into all of our decision-making — is understood and accepted, it is our belief that we will move toward a sustainable and prosperous future for Albertans. Much remains to be done before we reach a condition of environmental and economic sustainability. But rather than wait for someone to come up with a perfect solution, we offer this practical and feasible first step. The principled strategic framework may not take us all the way to sustainability, but we believe it will keep us moving in the right direction as we search for more precise guidelines.

The Public Advisory Committees have reached consensus on the vision, objectives, and aims of the Alberta Conservation Strategy. We now offer to interested groups, industry, business, government employees, and any and all Albertans an opportunity to comment and to reject, modify, or approve our work.

The Alberta Conservation Strategy project has been based on the steady support of the Environment Council of Alberta, and the cooperation of volunteers, government agencies, industry, and many others.

At their 1985 annual meeting, the Public Advisory Committees (PAC) unanimously passed a resolution calling upon the Government of Alberta to ask the Environment Council of Alberta to conduct public hearings on the draft Strategy. In the meantime, the Alberta Government endorsed the 1987 report of the National Task Force on Environment and Economy, which recommended that every province and territory have a conservation strategy in place by 1992.

This same report also recommended the establishment of provincial and territorial Round Tables on Environment and Economy. Most Round Tables are now in place, and in virtually every case, this body has been asked to prepare a sustainable development strategy for its jurisdiction. The Alberta Round Table on Environment and Economy was appointed in May 1990. Material prepared for the conservation strategy project will be presented to the Round Table for its use in the drafting of a sustainable development strategy for Alberta.

In the interim, there is much in this strategy package to encourage Albertans — as individuals, organizations, and businesses — to examine their activities, lifestyles, investments, and planning and make decisions **now** that incorporate sound economic and environmental principles.

We can continue to discuss the concepts and principles of sustainable development with our friends and colleagues, with community leaders, decision-makers, industry representatives, and with politicians at all levels of government. But we must move

beyond the discussion phase and begin the sometimes-difficult process of economic and social change that will be necessary for sustainable development to become a reality. This document is one step in that process.

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Appendix 1

Alberta Conservation Strategy Steering Committee

Joan Snyder, Chair
Elmer Kure, Vice-Chair

A.A. (Bert) Einsiedel, Jr.
W. A. (Bill) Flook
Helen Heacock
Shirley Henderson
Louise Horstman
Betty Hunter
Phil Lulman
Janis McLean-Hayden
Susan Nelson Pier
Betty Paschen
Bill Peel
Maryhelen Posey
R.M. (Bob) Richardson
Mary Stephenson
Guy Swinnerton
Robyn Usher
Pamela Wight

Appendix 2

ORGANIZATIONS

Represented on the Public Advisory Committees

Academic Women's Association
Alberta Association for the Environmentally Hypersensitive
Alberta Association of Architects
Alberta Association of Canadian Institute of Planners
Alberta Association of Landscape Architects
Alberta Association of Municipal Districts and Counties
Alberta Association of Registered Nurses
Alberta Cancer Board
Alberta Conservation Tillage Society (ACTS)
Alberta Federation of Labour
Alberta Fish and Game Association
Alberta Forest Products Association
Alberta Institute of Agrologists
Alberta Irrigation Projects Association
Alberta Lung Association
Alberta Medical Association
Alberta Pharmaceutical Association
Alberta Public Health Association
Alberta Research Council
Alberta School Trustees' Association
Alberta Snowmobile Association
Alberta Society of Professional Biologists
Alberta Trappers' Central Association
Alberta Urban Municipalities Association
Alberta Veterinary Medical Association
Alberta Wheat Pool
Alberta Wilderness Association
Alberta Women's Institute
Alpine Club of Canada (The)
Archaeological Society of Alberta
Association of Professional Engineers, Geologists and Geophysicists of Alberta
Calgary Chamber of Commerce
Calgary Local Council of Women
Calgary Regional Planning Commission
Canada West Foundation
Canadian Institute of Forestry
Canadian Institute of Public Health Inspectors (Alberta Branch)
Canadian Manufacturers' Association
Canadian Meteorological and Oceanographic Society (Alberta Centre)
Canadian Nature Federation
Canadian Parks and Wilderness Association
(CPAWS) (Edmonton Chapter)
(CPAWS) (Calgary-Banff Chapter)
Canadian Petroleum Association
Canadian Society of Environmental Biologists (Alberta Chapter)
Canadian Union of Postal Workers, Edmonton and Area Local
Christian Farmers Federation
Citizens for Public Justice
City of Airdrie
City of Calgary
City of Camrose
City of Drumheller
City of Edmonton
City of Fort McMurray
City of Fort Saskatchewan
City of Grande Prairie
City of Leduc
City of Lethbridge
City of Lloydminster
City of Medicine Hat
City of Red Deer
City of Wetaskiwin
Coal Association of Canada
Cold Lake Community Advisory Committee
College of Chiropractors of Alberta
Community Planning Association of Alberta
Consumers' Association of Canada
Council of Alberta Rural Ratepayers' Associations
County of Strathcona
Dryland Salinity Control Association
Ducks Unlimited Canada
Edmonton Chamber of Commerce
Edmonton Local Council of Women
Electric Utility Planning Council
Energy Resources Conservation Board
Entomological Society of Alberta
Federation of Alberta Naturalists
Foothills Protective Association
Fort Saskatchewan Regional Industrial Association
Health Unit Association of Alberta
Heavy Crude Council
Improvement District No. 16
Law Society of Alberta
Lloydminster Chamber of Commerce
Save Tomorrow Oppose Pollution (STOP)
Sierra Club of Alberta
Society for the Protection of Architectural Resources in Edmonton (SPARE)
Solar Energy Society (Calgary Chapter)
Southern Alberta Environmental Group
Strathcona Industrial Association
Sustainable Agriculture Association (The)
Swift Fox Conservation Society
Trout Unlimited
Unifarm
United Farmers of Alberta Co-operative Ltd.
University Womens' Club of Edmonton
(Canadian Federation of University Women)
Western Barley Growers' Association
Western Stock Growers' Association
Wildlife Society of Canada
Women of Unifarm
YWCA

Educational Institutions

Athabasca University
Canadian Union College
Cascade Society of Mount Royal College
Concordia College
Grande Prairie Regional College
Keyano College
Lakeland College — Vermilion Campus
Lethbridge Community College
Medicine Hat College
Mount Royal College
Mount Royal College, Students' Association
Northern Alberta Institute of Technology
Olds College
Red Deer College
Southern Alberta Institute of Technology
University of Alberta
University of Calgary
University of Lethbridge

(as of September 1989)

Alberta Conservation Strategy Publications

Appendix 3

October 1990

Prospectus for an Alberta Conservation Strategy

Gives the underlying philosophy and objectives of the ACS, and provides a context through a brief description of Alberta's geography, natural resources, and settlement patterns. Describes the links between the ACS and the World Conservation Strategy. Includes supplementary reading list.

March 1987. Revised. 60 pages.

What Is A Conservation Strategy?

A wide-ranging, in-depth look at the idea of strategies. Discusses the World Conservation Strategy and the Alberta Conservation Strategy in light of the general principles and concepts described.

September 1986. 14 pages.

ACS Update

A newsletter about the ACS project. Reports on progress toward implementing conservation strategies in Alberta and other jurisdictions. Includes announcements of new ACS publications.

Produced approximately quarterly.

Alberta Conservation Strategy: Strategic Framework in Brief (Draft)

A draft for public discussion, describing the principled decision structure that is central to the Alberta Conservation Strategy project. Also includes the objectives and aims identified by the project for moving toward sustainable development.

April 1990. 19 pages.

Reserves for Nature

Discusses the theory and practice of setting aside certain areas to preserve natural ecological functions. Also discusses whether the effects of human activities prevent the reserves from achieving the goals they were intended to accomplish. Includes extensive bibliography.

ACS Sector Report. November 1987. 31 pages.

Resolving Conflict: A Case Study

Using the example of Hewitt Oil (Alberta) Ltd.'s application to construct a sour gas processing plant in the Golden Spike area near Edmonton, this paper describes an alternative method of resolving conflicts that can be applied to achieve win-win results in a broad range of situations.

ACS Sector Report. February 1988. 21 pages.

Environment By Design: The Urban Place in Alberta

Examines the urban environment from a broad environmental perspective, pointing out the interconnections of our economic systems, our decision-making systems, and our environment. A major focus of the paper is on maintaining a sustainable urban environment.

ACS Sector Report. March 1988. 43 pages.

Tourism in Alberta

Looks at the present and possible future partnership of tourism and the environment. The requirements of the tourism industry for a healthy attractive environment are discussed and the effects of tourism on the environment are examined. Points out the implications for policy development in Alberta, including the desirability of a Provincial Tourism Master Plan.

ACS Sector Report. May 1988. 44 pages.

Energy Conservation: A Goal for Albertans?

Looks at energy use in general in Alberta. Discusses the costs and benefits of using energy more efficiently, and calculates total savings possible through conservation.

ACS Sector Report. October 1988. Revised. 13 pages.

Agricultural Considerations for Today and Tomorrow

Provides an overview of the context within which the farmers and ranchers of Alberta make decisions. How those decisions affect Alberta's renewable, non-renewable, and human resources is discussed.

ACS Sector Report. June 1988. 38 pages.

Renewable Energy: The Power and the Potential

Development of our renewable energy sources could extend the life of Alberta's fossil fuels and provide energy when the nonrenewables are gone. This report explores the present and potential economic significance of renewables, and their capacity to meet Alberta's demand for energy.

ACS Sector Report. August 1988. 30 pages.

Dinosaurs and Distant Drums: The Future for Alberta's Heritage Resources

Our cultural heritage helps us to understand how technology, lifestyles, and the economy affect our natural resources. This report examines the protection and use of our cultural heritage, from fossils and artifacts to historic trails and museums.

ACS Sector Report. November 1988. 47 pages.

Foundations for the Future: Alberta's Mineral Resources

Looks at factors to consider in developing mineral management strategies that will support long-term economic development. These include "resource sterilization," environmental impacts, integrated planning, and the gaps in the current knowledge of our mineral resources.

ACS Sector Report. April 1989. 24 pages.

EE2000: Environmental Education for a Sustainable Future

Looks at the role of formal and informal environmental education in helping society reach the goal of sustainable resource use. Identifies some important environmental education issues, suggests tools for dealing with them, and offers a series of recommendations appropriate for many audiences.

ACS Sector Report. August 1989. 27 pages.

Oil and Gas in Alberta: An Uncertain Future

Examines the future of oil and gas development. Looks at the interaction of petroleum exploration and production with other resource uses. Discusses economic, technological, social, environmental and health concerns that will influence future oil and gas developments.

ACS Sector Report. October 1989. 53 pages.

A Place for Wildlife

Describes wildlife management in Alberta – past, present, and future. Examines the impacts of resource development on wildlife habitat and presents arguments for bolder, better conservation initiatives.

ACS Sector Report. November 1989. 39 pages.

Healthy Planet, Healthy People

Discusses the links between health and the environment, and the role of the environment in maintaining our physical and mental health. Looks briefly at the Healthy Communities project in Canada and Alberta.

ACS Sector Report. November 1989. 18 pages.

Alberta's Wetlands: Water in the Bank!

Explores the three obstacles to sustainable wetland use: lack of knowledge about wetlands functions and benefits; lack of quantitative data on the value of wetlands; and competing legislative regimes. Provides recommendations about how to overcome these obstacles.

ACS Sector Report. October 1990. 37 pages.

More sector reports will be available soon. To receive notification of these documents, add your name to the ACS mailing list by contacting the Environment Council of Alberta at the address on the inside title page.

About Our Logo

Alberta

ENVIRONMENT COUNCIL OF ALBERTA

Over the past two decades, the logo of the Environment Council of Alberta has shown three overlapping triangles as representing the foundations of our environment: land, air, and water. These triangles also represent the three groups with which the ECA interacts: industry, government, and the public. The three triangles intersect to form a circle symbolizing the biosphere. The small triangle in the centre of the circle symbolizes these three groups joining together to work for the conservation of our environment.

In 1980, the overlapped triangle motif was used by the World Conservation Strategy to represent the three primary objectives of that document. The Alberta Conservation Strategy incorporated the triangle motif into its logo by overlaying the WCS triangles onto a three dimensional outline of Alberta. This combination of triangles with the readily identifiable outline of provinces, nations, and regions has marked conservation strategies around the world.